

### 3.—A blind mygalomorph spider from a Nullarbor Plain cave

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Manuscript received 21 May 1968; accepted 17 September, 1968

#### Abstract

Extensive exploration of Nullarbor Caves in recent years has revealed the existence of an arthropod cave fauna, including three species of blind spiders. Fragments of a blind mygalomorph spider (Dipluridae: Diplurinae) have been collected. This spider is here described as a new genus and species—*Troglodiplura lowryi*.

#### Introduction

Several cave-dwelling spiders have for long been known in Australia, the most notable is the "Tasmanian cave spider", *Hickmania troglodytes*, which is a relict species of the family Hypochilidae (Goede, 1967). Equally well known at least to speleologists, in the limestone caves of south west of Western Australia, is the large *Epimecinus teegenarioides* (Dictynidae). Both of these spiders occur in the twilight zone and *Hickmania* at least is also frequently found in sheltered situations outside caves. Neither of these species nor any of the other spiders previously observed in caves in Australia show any special modifications to a cave existence.

As a result of extensive exploration, in recent years of Nullarbor caves and the collection from them of fauna, several troglobitic creatures have been discovered. Mackerras (1967) described the blind cockroach, *Troglolatella nullarborensis*, of which living specimens have been collected from several caves. Three living specimens of two species of blind araneomorph spiders have also been collected and are to be described elsewhere by M. G. Gray. In addition, fragments of a blind mygalomorph spider were found amongst remains of cockroaches and beetles collected by D. C. and J. W. J. Lowry in August 1966 from Roaches Rest Cave, 27 miles NE of Madura. Amongst these fragments were two tarsi each with three claws attached. The bipectinate upper tarsal claws determined the specimen as a member of the sub-family Diplurinae of the Dipluridae. The broad carapace and the shape and position of the sternal sigilla (distant from the margin) preclude the specimen from being placed in either of the diplurine genera commonly found on the surface of the Nullarbor Plain, *Chenistonia* and *Dekana*. In these two features I regard it as distinct from all known Diplurinae.

One is necessarily reluctant to erect a genus on the basis of such fragments and it is to be hoped that further collecting will yield living material. However since no living creatures have been observed in Roaches Rest Cave (J. W.

J. Lowry, personal communication) and bearing in mind that surface distribution of such a blind spider would be difficult, the possibility that it is extinct must be considered. Therefore it seems justifiable to record the occurrence without waiting for possible intact or living specimens. If still extant the Mygalomorph would presumably live in a burrow, possibly with silk prey-trap extensions in detritus of the cave floor, or in a silk tube on the walls or roof of the cave, thus rendering it less conspicuous than either the cockroaches or the other two species of spiders.

#### *Troglodiplura* gen. n.

With the general characters of the sub-family Diplurinae, namely paired tarsal claws bipectinate. Cheliceral furrow with complete row of teeth on inner margin and an outer basal irregular group of granular teeth. Carapace broad with rounded sides, width approximating length; fovea straight and shallow. Eyes absent. Sternum broad, width approximating length; sigilla oval and situated well away from margin. Labium broad, deep anterior indentation. At least some tarsi dorso-ventrally curved and with scopula.

#### *Troglodiplura lowryi* sp. n.

*Holotype*: Sex ? Fragments only. Collected with cockroach fragments from Roaches Rest Cave, 27 miles NE of Madura (type locality), 29.viii.1966 by D.C. and J. W. J. Lowry. Deposited in the Western Australian Museum. Register Number WAM 68-342.

*Fragments consist of*: incomplete carapace with left chelicera, labium and anterior piece of sternum attached; right chelicera originally loosely attached but became free; two other fragments of sternum, one piece of which contains two posterior sigilla of left side; two maxillae (coxae of pedipalps); two anterior ? tarsi with claws intact and internally, strands of muscle. Colour of fragments a light brown or tan with tarsal claws and fangs of chelicerae black.

*Carapace* (Fig 1 A) incomplete, posterior median section missing. Broad with rounded sides. Glabrous, hairless but with a few 'pits' or 'sockets' from which hairs and bristles have become detached on anterior margin. Fovea straight. Eyes absent. Width at front of carapace, 5.0mm; width at widest part (across fovea), 9.7mm; approximate length, 10.5mm. [anterior margin to fovea, 6.50mm, fovea to posterior edge probably 4.0mm].

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*Sternum* with sparse scattered hairs and fine bristles (Fig. 1 B). Length (approximately) 5.0mm; width (approximately) 5.0 mm. Obtusely pointed posteriorly. Three pairs sigilla, broad ovoid outline; posterior sigilla approximately three times their long diameter from margin.

*Labium*, 1.9 mm wide, 1.0 mm long, anteriorly indented, with fine hairs and bristles (Fig. 1 B). *Maxillae* with group of cuspules on inner angle (Fig. 1 D, E).

*Chelicerae* with dorsal 'pits' indicating presence of now detached bristles. Furrow of right chelicera with nine large teeth on inner margin and a posterior group of about ten granules (Fig. 1 C). No teeth on outer margin.

*Tarsus* (a) with dorso ventral curvature. Scattered bristles and a few ventral apical slender spines, numerous 'pits' from which bristles detached. A ventral scopula of short dense pile. Length, 6.2mm. Upper claws

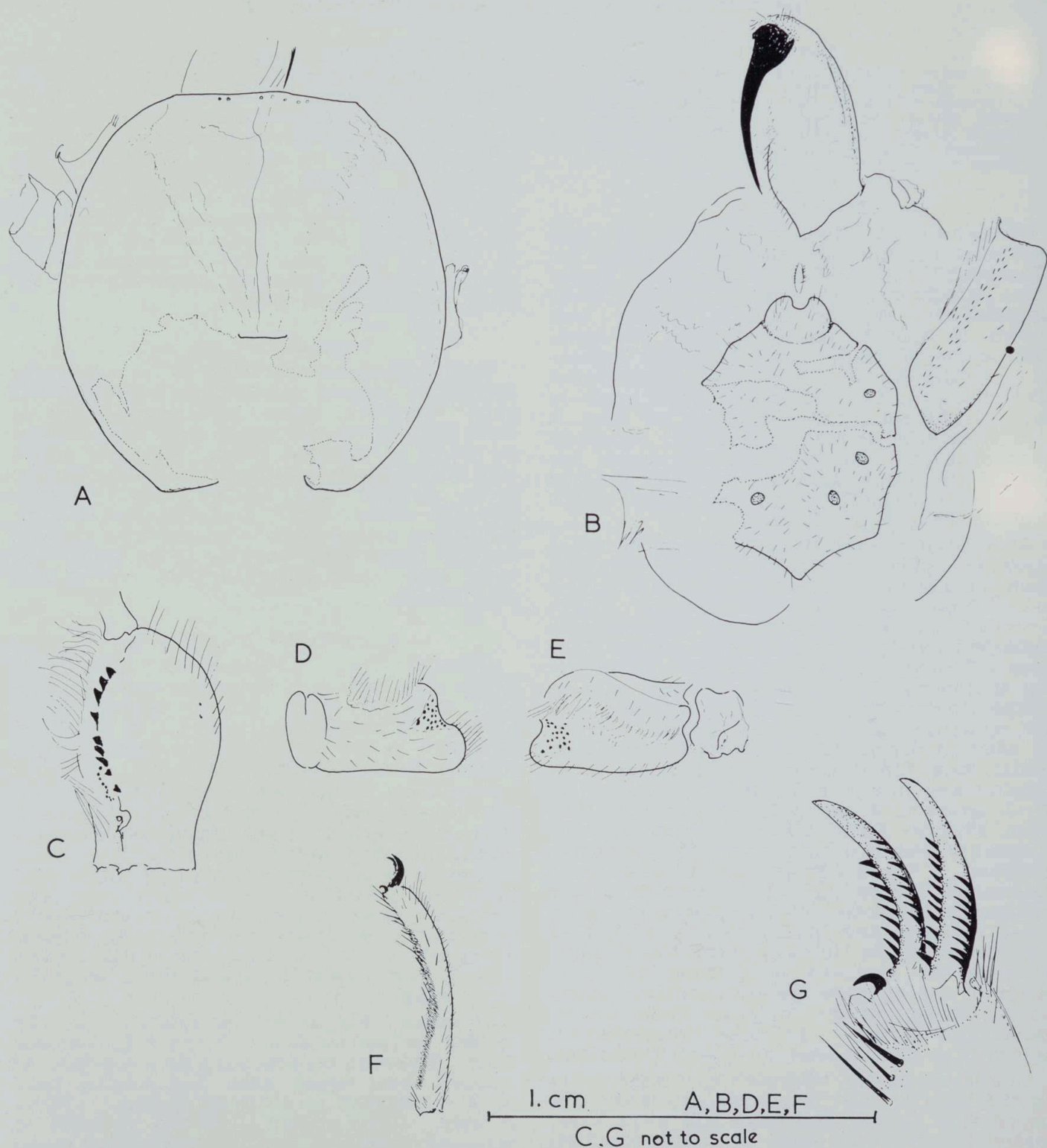


Figure 1.—*Troglodiplura lowryi* gen. et. sp. nov. A.—Carapace. B.—Ventral aspect carapace, sternum, labium, left chelicera. C.—Right chelicera. D, E.—Right and left maxillae; left maxilla rotated slightly backwards. F.—Tarsus (b). G.—Tarsal claws of tarsus (a).



bipectinate; one claw 9 outer, 8 inner teeth, the other claw with 9 outer and 11 inner teeth (Fig. 1 G). Median claw smooth.

*Tarsus* (b) (Fig. 1 F) length, 6.0mm. Short dense scopula. Hairs and bristles present. More sharply curved than first specimen. Pectinations on claws, 10 outer, 8 inner; 9 outer, 9 inner. It is not possible to tell whether tarsi are from left or right side but due to arched tendency are presumably of the first and second legs.

*Habitat*: Fragments were found amongst cockroaches collected by D. C. and J. W. J. Lowry, between 50 and 200 yards from cave entrance in total darkness, Roaches Rest Cave.

### Discussion

The occurrence of a troglobitic mygalomorph from a Nullarbor cave is of interest for several reasons. First, although several mygalomorph spiders have been reported as inhabiting caves of tropical regions only two of these are blind species—*Accola caeca* Simon (Dipluridae) and *Troglothele caeca* Fage (Barychelidae). The Roaches Rest specimen is the only record of a cavernicolous Mygalomorph in Australia. Secondly it implies that the caves have been inhabited by other creatures for a very considerable time. For a predator, which is largely confined to a burrow, to have become established in a cavernicolous habitat and to have developed troglobitic characters, it must first have had an abundant and continuous prey source readily available. In this instance it is probable that the invertebrate food chain is dependent basically on bats—on the guano of which the cockroaches feed. The mygalomorph would probably feed on both cockroaches and beetles and in addition possibly crickets, and casual invaders of the caves.

Moore (1964) has commented on the paucity of Australian troglobites and the converse abundance of troglaphiles and troglloxenes. This he interprets, at least for Tasmania and south eastern Australia, as due to a secondary invasion of cave habitats following extermination of primary troglobites due to hot dry interglacial periods of the Pleistocene. Moore suggested that New Zealand troglobitic beetles are hygrophilous relics of an early Pleistocene period. However it is possible that the Nullarbor troglobites (spiders and cockroaches) are much older. Amongst other spiders collected from the Nullarbor caves there are no second level troglaphiles as defined by Hamilton-Smith (1967). It would seem that the troglobites themselves are relics of a primary invasion which could date from any time subsequent to the fall in Miocene sea level and once a vegetation and fauna established on the surface. This would be in agreement with the suggestion that "cave genesis" on the Nullarbor Plain began during the Tertiary (Hamilton-Smith, 1967) and not as suggested by some authors, during the Pleistocene.

### Acknowledgments

My thanks are due to Mr. and Mrs. D. C. Lowry who collected the spider fragments.

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